COMPUTERS & EDUCATION

Editors: David F. Rogers
Michael Kibby

Author Index and Volume Contents

VOLUME 16

1991

Pergamon Press
Oxford · New York · Frankfurt
Seoul · Sydney · Tokyo

computers and education

An International Journal

EDITORS

Professor DAVID F. ROGERS
Aerospace Engineering Academy
U.S. Naval Academy
Annapolis
MD 21402, U.S.A.

Dr MICHAEL KIBBY
Centre for Academic Practice
University of Strathclyde
Glasgow G1 1QE
Scotland

EDITORIAL ADVISORY BOARD

A. A. Pouring, U.S.A. (Founder Editor)
P. R. Smith, U.K. (Founder Editor)

M. H. Aston, U.K.
N. Gardner, U.K.
M. Gigante, Australia
R. D. Harding, U.K.
J. R. Hartley, U.K.
A. Hawkins, The Netherlands
T. Hinton, U.K.
T. Kurtz, U.S.A.
J. Liebowitz, U.S.A.
J. Matthews, U.K.
T. Plomp, The Netherlands
T. Sakamoto, Japan
J. Schoenmaker, The Netherlands
W. L. Staats, U.S.A.
D. J. Stevens, U.S.A.
P. Thorne, Australia

Publishing Office:
Pergamon Press plc, Pergamon House, Bampfylde Street, Exeter EX1 2AH, U.K.
[Tel. Exeter (0392) 51558; Fax (0392) 425370]

Subscription and Advertising Offices:
North America: Pergamon Press Inc., Maxwell House, Fairview Park, Elmsford, NY 10523, U.S.A.
Rest of the World: Pergamon Press plc, Headington Hill Hall, Oxford OX3 0BW, U.K.
[Tel. Oxford (0865) 794141].

Annual Subscription Rates 1991: Annual institutional subscription rate (1991) DM 925.00; 2-year institutional rate (1991/92) DM 1757.50; a personal subscription rate for those whose library subscribes at the regular rate is available on request. Subscription rates for Japan include despatch by air and prices are available on application. Prices are subject to amendment without notice.

Back Issues: Back issues of all previously published volumes, in both hard copy and on microform are available direct from Pergamon Press offices.

Publication Frequency: 8 issues/annum in 2 volumes.

Copyright © 1991 Pergamon Press plc

It is a condition of publication that manuscripts submitted to this journal have not been published and will not be simultaneously submitted or published elsewhere. By submitting a manuscript, the authors agree that the copyright for their article is transferred to the publisher if and when the article is accepted for publication. However, assignment of copyright is not required from authors who work for organizations which do not permit such assignment. The copyright covers the exclusive rights to reproduce and distribute the article, including reprints, photographic reproductions, microform or any other reproductions of similar nature and translations. No part of this publication may be reproduced, stored in a retrieval system or transmitted in any form or by any means, electronic, electrostatic, magnetic tape, mechanical, photocopying, recording or otherwise, without permission in writing from the copyright holder.

Whilst every effort is made by the publishers and editorial board to see that no inaccurate or misleading data, opinion or statement appears in this journal, they wish to make it clear that the data and opinions appearing in the articles and advertisements herein are the sole responsibility of the contributor or advertiser concerned. Accordingly, the publishers, the editorial board and editors and their respective employees, officers and agents accept no responsibility or liability whatsoever for the consequences of any such inaccurate or misleading data, opinion or statement.

Photocopying information for users in the U.S.A.: The Item-fee Code for this publication indicates that authorization to photocopy items for internal or personal use is granted by the copyright holder for libraries and other users registered with the Copyright Clearance Center (CCC) Transactional Reporting Service provided the stated fee for copying, beyond that permitted by Section 107 or 108 of the United States Copyright Law, is paid. The appropriate remittance of $3.00 per copy per article is paid directly to the Copyright Clearance Center Inc., 27 Congress Street, Salem, MA 01970, U.S.A.

Permission for other use: The copyright owner's consent does not extend to copying for general distribution, for promotion, for creating new works, or for resale. Specific written permission must be obtained from the publisher for such copying. *The Item-fee Code for this publication is:* 0360-1315/91 $3.00 + 0.00

♾™The paper used in this publication meets the minimum requirements of American National Standard for Information Sciences—Permanence of Paper for Printed Library Materials, ANSI Z39.48-1984.

CONTENTS

No. 1

EURIT 90

A European Conference on Technology and Education

	v	Eurit 90 Organizing Committees
Keynote Addresses		
Noel Thompson	1	Computers, curriculum and the learning environment
Alfons ten Brummelhuis, Willem J. Pelgrum and Tjeerd Plomp	7	Status of introductory computer education in The Netherlands: results of a survey
General Papers		
Reg North	13	Managing the integration of information technology across the curriculum of the secondary school
Bram van Weering and Tjeerd Plomp	17	Information literacy in secondary education in The Netherlands: the new curriculum
John S. A. Anderson	23	Information technology—a cross-curricular competence for all pupils
Anne Welle-Strand	29	Evaluation of the Norwegian Program of Action: the impact of computers in the classroom and how schools learn
Peter Gorny	37	Fundamental informatics in teacher education in West Germany
Vasilios Makrakis	43	Computer-resource teachers: a study and a derived strategy for their use in in-service training
A. McKeown and J. Gardner	51	Evaluating technology based training (TBT): the issues and methods
Frances Blow	57	Information technology: catalyst for change in history teaching in schools
Deryn M. Watson	65	SCRIPTWRITER: framework software and its relationship with the curriculum
Margaret Cox and Ulrich Bosler	71	Training authors to develop educational software through the adaption of foreign software
Erik Poulsen	77	Writing processes with word processing in teaching English as a foreign language

Janne Wandall	83	Student counselling by means of computer software
David Squires	87	Learning through multi-user network CAL
Isabelle Borne and Colette Girardot	93	Object-oriented programming in the primary classroom
Peter Goodyear	99	A knowledge-based approach to supporting the use of simulation programs
Ilta Kankaanrinta	105	Studying a Finnish forest ecosystem with a simulation program
Amanda Maria Ropa	109	Designing a multimedia, interactive interface to facilitate cultural understanding in a fifth grade classroom
John Layman and Wendy Hall	113	Applications of hypermedia in education
E. Giannotti, P. Fanghella and C. Galletti	121	Hypertexts for machine theory education
D. Ponta, G. Donzellini and G. Parodi	127	Practical electronics taught by hypertext: the WORKBENCH project
Announcement	I	

No. 2

Peter Cope and Malcolm Simmons	133	Children's exploration of rotation and angle in limited Logo microworlds
Paola Forcheri and Maria Teresa Molfino	143	Designing a knowledge-based learning environment for arithmetic concepts
F. Layne Wallace and Susan R. Wallace	153	An undergraduate course in artificial neural networks
L. Borghi, A. De Ambrosis, G. Gazzaniga, L. Ironi, P. Mascheretti and C. I. Massara	157	Practical use of simulations to study relative motion
Sharon B. Reynolds, Michael E. Patterson, Lisa P. Skaggs and Donald F. Dansereau	167	Knowledge hypermaps and cooperative learning
Barbara J. Cordell	175	A study of learning styles and computer-assisted instruction
Rob Koper	185	Inscript: a courseware specification language
John Murnane	197	Models of recursion

Roderick I. Nicolson, Susan Pickering and Angela J. Fawcett 203 A HyperCard™ spelling support environment for dyslexic children

D. Ingram, R. V. H. Jones, A. F. Lant and I. G. Finlay 211 "Cancer patients and their families at home": an interactive videodisc for doctors and district nurses

Book Review 217

Announcement I

No. 3

C. Dianne Martin 219 New findings from qualitative data using hypermedia: microcomputers, control and equity

Stephen Schiffman 229 A comparison of join operations in dBASE IV

Janice E. J. Woodrow 237 Locus of control and computer attitudes as determinants of the computer literacy of student teachers

Janice E. J. Woodrow 247 Determinants of student teacher computer literacy achievement

Lawrence A. Klein, Michael J. Cerullo and M. Virginia Cerullo 257 Comparative longitudinal study on microcomputer availability and usage in accounting curriculums

Yehoshafat Shafee Give'on 267 Teaching recursive programming using parallel multi-turtle graphics

Book Review 281

Announcement I

No. 4

A. Durndell 283 The persistence of the gender gap in computing

P. Wild 289 The effectiveness of INSET in CAL and IT: an evaluation of the work of an advisory teacher

Kathryn M. Verreault, Daniel A. Verreault and Mayda Shorney 301 Measuring improvement and effort in megasections

A. S. Baldwin 307 From Magellan to the next millenium computers in Pacific Island schools

Bernard H. Carson 311 Algorithms for determining planar area properties from peripheral points

Hitohisa Asai 323 Discipline Pascal with descriptive environment; precise writing to learn programming and to avoid errors

Tjeerd Plomp, Jacqueline Pilon and Ingeborg Janssen Reinen 337 The effectiveness of remedial computer use for mathematics in a University setting (Botswana)

R. A. Lewis, B. M. Harper and Michael Wilson 349 Computer assignments and problems classes for physics students

AUTHOR INDEX

Anderson J. S. A., 23
Asai H., 323

Baldwin A. S., 307
Blow F., 57
Borghi L., 157
Borne I., 93
Bosler U., 71
ten Brummelhuis A., 7

Carson B. H., 311
Cerullo M. J., 257
Cerullo M. V., 257
Cope P., 133
Cordell B. J., 175
Cox M., 71

Dansereau D. F., 167
De Ambrosis A., 157
Donzellini G., 127
Durndell A., 283

Fanghella P., 121
Fawcett A. J., 203
Finlay I. G., 211
Forcheri P., 143

Galletti C., 121
Gardner J., 51
Gazzaniga G., 157
Giannotti E., 121
Girardot C., 93
Give'on Y. S., 267
Goodyear P., 99
Gorny P., 37

Hall W., 113
Harper B. M., 349

Ingram D., 211
Ironi L., 157

Jones R. V. H., 211

Kankaanrinta I., 105
Klein L. A., 257
Koper R., 185

Lant A. F., 211
Layman J., 113
Lewis R. A., 349

Makrakis V., 43
Martin C. D., 219
Mascheretti P., 157
Massara C. I., 157
McKeown A., 51
Molfino M. T., 143
Murnane J., 197

Nicolson R. I., 203
North R., 13

Parodi G., 127
Patterson M. E., 167
Pelgrum W. J., 7
Pickering S., 203
Pilon J., 337
Plomp T., 7, 17, 337
Ponta D., 127
Poulsen E., 77

Reinen I. J., 337
Reynolds S. B., 167
Ropa A. M., 109

Schiffman S., 229
Shorney M., 301
Simmons M., 133
Skaggs L. P., 167
Squires D., 87

Thompson N., 1

Verreault D. A., 301
Verreault K. M., 301

Wallace F. L., 153
Wallace S. R., 153
Wandall J., 83
Watson D. M., 65
van Weering B., 17
Welle-Strand A., 29
Wild P., 289
Wilson M., 349
Woodrow J. E. J., 237, 247

TYPESET IN GREAT BRITAIN BY BPCC TECHSET LTD, EXETER. PRINTED BY BPCC WHEATONS LTD, EXETER